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Indian Standard

SPECIFICATION FOR TAPE, NYLON, TUBULAR FOR AEROSPACE APPLICATIONS

(First Revision)

First Reprint AUGUST 2005)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3 *January* 1982

AMENDMENT NO. 1 JULY 1984

TO

IS:6349-1981 SPECIFICATION FOR TAPE, NYLON, TUBULAR FOR AEROSPACE APPLICATIONS

(First Revision)

Alteration

(*Page 4, clause 2.5, under column 'Weft', against Type II*) - Substitute the following for the existing:

'5 or any number of ply, the resultant tex (denier) should be 117 tex (1 050 d)'.

(TDC 27)

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Indian Standard
SPECIFICATION FOR TAPE, NYLON, TUBULAR FOR AEROSPACE APPLICATIONS
(First Revision)

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(*Continued on page* 2)

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Indian Standard

SPECIFICATION FOR
TAPE, NYLON, TUBULAR FOR AEROSPACE APPLICATIONS

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 November 1981, after the draft finalized by the Textile Materials for Aerospace Purposes Sectional Committee had been approved by the Textile Division Council.

0.2 This standard is based on IND/ADE/0068 Tape Nylon Tubular 2·54 cm (1 364 kg), undyed and IND/ADE/0061 Tape Nylon Tubular 2·54 cm (240 kg), undyed, issued by the Ministry of Defence, Government of India.

0.3 The present revision of this standard has been taken up to align it with IS : 9267-1979*.

0.4 Standard of Weights and Measures Act, 1976 stipulates the use of International System of Units in the country; in order to familiarize the industry with this system, the recommended SI units for use in the textile are given in Appendix A.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers two types of tubular nylon tapes used in the aerial delivery equipment including personnel parachutes.

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*Specification for nylon tubular webbing for aerospace purposes.

†Rules for rounding off numerical values (*revised*).

2. MATERIALS

2.1 The following high tenacity nylon yarns made out of nylon 66 or nylon 6 may be used in the manufacture of nylon tubular tape:

Count	*Tenacity*
23·3 tex (210 d)	54 g/tex (6g/d)
93·3 tex (840 d)	72 g/tex (8g/d)
186·6 tex (1 680 d)	72 g/tex (8g/d)

2.2 The nylon yarn shall be bright, light and heat resistant and have melting point not less than 247°C for nylon 66 and not less than 215°C for nylon 6.

2.3 The twist in the final ply shall not be less than 100 *t* pm when tested as given in IS : 832-1964*.

NOTE — In order to ascertain whether nylon 66 or 6 is used the method of test for the determination of melting point as per IS : 5762-1970† may be followed.

2.4 The nylon yarn shall be free from stains, finishing and dressing materials.

2.5 The number of plies in the yarn shall be as follows:

Type	*Warp*	*Weft*
Type I	8 or 2 or 1	4 or 1
Type II	2 or 1	5 or any No. of ply, the resultant tex (denier) should be 76·5 tex (1 050 d)

3. REQUIREMENTS

3.1 The finished nylon tape shall meet the requirements given in Table 1.

3.2 Residual Shrinkage — The residual shrinkage of the nylon tubular tape shall not exceed 2·0 percent when tested in accordance with IS : 2977-1964‡.

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*Method for determination of twist in yarn.

†Methods for determination of melting point and melting range.

‡Method for determination of dimensinal changes of woven fabrics (other than wool) on soaking in water.

TABLE 1 REQUIREMENTS FOR TAPE, NYLON, TUBULAR FOR AEROSPACE APPLICATIONS

Sl. No.	Characteristic	Requirement for		Method of Test, Ref to
		Type I	Type II	
i)	Length of roll	100 m, or as required by the buyer. 10 percent of the supplies may be made in short length pieces subject to the condition that short length pieces are 20 metre or its multiples.		IS : 1954-1969*
ii)	Width, mm Tolerance in mm	25 + 2 −0		
iii)	Thickness, mm, *Max* under a pressure of 2 N	2·3	1·5	IS : 7702-1975†
iv)	Ends in full width, *Min*	160	206	IS : 1963-1969‡
v)	Picks/dm Tolerance	100 + 2	170 ± 4	
vi)	Mass, g/m, *Max*	39	12	IS : 1964-1970§
vii)	Breaking load in full width × 20 cm between grips, N, *Min*	13 377	2 352	IS : 1969-1968‖
viii)	Elongation at break, *Min*	16 percent		
ix)	Weave	Tubular, Plain 1/1		

NOTE 1 — Prior to cutting test specimens for mass (g/m^2) test, the nylon tubular tape shall be subjected to a tension equal to its one percent specified minimum breaking load for 60 ± 5 seconds on a breaking load testing machine.

NOTE 2 — 1N = 0·102 kgf.

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*Methods for determination of length and width of fabrics (*first revision*).

†Methods for determination of thickness of woven and knitted fabrics.

‡Methods for determination of threads per decimetre in woven fabrics (*first revision*).

§Methods for determination of weight per square metre and weight per linear metre of fabrics (*first revision*).

‖Method for determination of breaking load and elongation at break of woven textile fabrics (*first revision*).

3.3 Resistance to Accelerated Ageing — The tubular nylon tape shall not lose more than 25 percent of its original breaking strength when subjected to treatment for accelerated ageing given in Appendix D of IS : 4727-1968*.

3.4 The tubular nylon tape shall not lose more than 25 percent of its original breaking strength after being kept in an oven for one hour at 180 ± 3°C and subsequently conditioned as given in IS : 6359-1971†.

3.5 Sealed Sample — If in order to illustrate or specify the characteristics like general appearance, colour, feel, etc, of the tubular nylon tape, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

4. PACKING

4.1 The tubular nylon tape rolls arranged in cylindrical form shall be tied with a 3-ply jute twine (*see* IS : 1912-1975‡) to form a pack, such packs, after being wrapped in 40 μm thick polyethylene film (*see* IS : 2508-1977§), shall be packed in wooden crates lined with water proof packing paper (*see* IS : 1398-1968||). The gross mass of the package shall not exceed 40 kg.

5. MARKING

5.1 Each roll shall provide the following information on a label attached to it.

a) Length (m), width (mm) and thickness (mm);

b) Date of manufacture in a suitable code;

c) Manufacturer's name/trade-mark;

d) Colour and finish, if not grey; and

e) Any other information desired by the purchaser.

---

*Specification for nylon webbing for aeronautical purposes.

†Method for conditioning of textiles.

‡Specification for country jute twine (*first revision*).

§Specification for low density polyethylene films (*first revision*).

||Specification for packing paper, waterproof, bitumen-laminated (*first revision*).

5.1.1 The product may also be marked with Standard mark.

5.1.2 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

6. SAMPLING

6.1 The sampling, inspection and testing scheme shall be detailed in the contract or order till the publishing of the 'Indian Standard on Sampling inspection and testing scheme for aerospace textile material' (*under preparation*).

NOTE — For selection of suitable single, double or multiple sampling plan, IS : 2500 (Part I)-1973* may be consulted.

APPENDIX A

(*Clause* 0.4)

RECOMMENDED SI UNITS FOR TEXTILES

Sl No.	*Characteristic*	*SI Unit*		*Application*
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
1.	Length	Millimetre	mm	Fibres
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate)
		Metre	m	Yarns, ropes, cordage, fabrics

---

*Sampling inspection tables: Part I Inspection by attributes and by count of defects (*first revision*).

Sl No.	*Characteristic*	*SI Unit*		*Application*
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
2.	Width	Millimetre	mm	Narrow fabrics
		Centimetre	cm	Other fabrics
		Millimetre, centimetre	mm, cm	Samples, test specimens (as appropriate) Carpets, druggets, *DURRIES* (as appropriate)
3.	Thickness	Micrometre (micron)	µm	Delicate fabrics
		Millimetre	mm	Other fabrics, carpets, felts
4.	Linear density	Tex	tex	Yarns
		Millitex	mtex	Fibres
		Decitex	dtex	Filaments, filament yarns
		Kilotex	ktex	Slivers, ropes, cordage
5.	Diameter	Micrometre (micron)	µm	Fibres
		Millimetre	mm	Yarns, ropes, cordage
6.	Circumference	Millimetre	mm	Ropes, cordage
7.	Threads in fabric			Woven fabrics (as appropriate)
	a) Lengthwise	Number per centimetre	ends/cm	
		Number per decimetre	ends/dm	
	b) Widthwise	Number per centimetre	picks/cm	
		Number per decimetre	picks/dm	

Sl No.	*Characteristic*	*SI Unit*		*Application*
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
8.	Warp threads in loom	Number per centimetre	ends/cm	Reeds
9.	Stitches in knitted fabric			Knitted fabrics (as appropriate)
	a) Lengthwise	Courses per centimetre Courses per decimetre	courses/cm courses/dm	
	b) Widthwise	Wales per centimetre Wales per decimetre	wales/cm wales/dm	
10.	Stitch length	Millimetre	mm	Knitted fabrics, made-up items
11.	Mass per unit area	Grams per square metre	g/m^2	Fabrics
12.	Mass per unit length	Grams per metre	g/m	Fabrics
13.	Twist	Turns per centimetre Turns per metre	turns/cm turns/m	Yarns, ropes, cordage (as appropriate)
14.	Test or gauge length	Millimetre, centimetre	mm, cm	Fibre, yarn and fabric specimens (as appropriate)
15.	Breaking load	Millinewton	mN	Fibres, delicate yarns (individual or skeins)
		Newton	N	Strong yarns (individual or skeins), ropes, cordage, fabrics

Sl No.	*Characteristic*	*Sl Unit*		*Application*
		Unit	Abbreviation	
(1)	(2)	(3)	(4)	(5)
16.	Breaking length	Kilometre	km	Yarns
17.	Tenacity	Millinewton per tex	mN/tex	Fibres, yarns (individual or skeins)
18.	Twist factor or twist multiplier	Turns per centimetre × square root of tex	$\text{turns/cm} \times \sqrt{\text{tex}}$	Yarns (as appropriate)
		Turns per metre × square root of tex	$\text{turns/m} \times \sqrt{\text{tex}}$	
19.	Bursting strength	Newton per square centimetre	N/cm^2	Fabrics
20.	Tear strength	Millinewton, newton	mN, N	Fabrics (as appropriate)
21.	Pile height	Millimetre	mm	Carpets
22.	Pile density	Mass of pile yarn in grams per square metre per millimetre pile height	$\text{g/m}^2\text{/mm}$ pile height	Pile carpets
23.	Elastic modulus	Millinewton per tex per unit deformation	mN/tex/unit deformation	Fibres, yarns, strands

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